

## **ABSTRACT**

The invention provides a photodiode with an increased charge collection area, laterally spaced from an adjacent isolation region. Dopant ions of a first conductivity type with a first impurity concentration form a region surrounding at least part of the isolation region. These dopant ions are further surrounded by dopant ions of the first conductivity type with a second impurity concentration. The resulting isolation region structure increases the capacitance of the photodiode by allowing the photodiode to possess a greater charge collection region while suppressing the generation of dark current.